CLAIMS

1. A system for melting ice, comprising:

an electrical conductor for generating an AEF in response to an AC voltage;

a gas-filled layer proximate to the electrical conductor, the gas-filled layer containing a plasma-forming gas for forming a plasma in response to an AEF.

2. A system as in claim 1, further comprising:

a conductive layer located proximate to the electrical conductor.

3. A system as in claim 2, wherein the gas-filled layer is located between the electrical conductor and the conductive layer.

4. A system as in claim 2, wherein the conductive layer comprises ice.

5. A system as in claim 1, wherein the electrical conductor is a main conductor of a power transmission line.

6. A system as in claim 1, further comprising:

an AC power source for applying an AC voltage to the electrical conductor.

7. A system as in claim 1, further comprising:

an AC voltage in the electrical conductor that generates an AEF, which AEF causes electric breakdown in the gas-filled layer.

8. A system as in claim 7, wherein the AC voltage has a frequency in a range of about from 50 Hz to 1 MHz.

9. A system as in claim 7, wherein the AC voltage has a voltage in a range of about from 10 kV to 1300 kV.

10. A system as in claim 1, wherein the gas-filled layer comprises a gas selected from the group consisting of air, nitrogen and argon.

11. A system as in claim 1, wherein the gas-filled layer has a thickness in a range of about from 0.5 to 10 mm.

12. A system as in claim 1, further comprising an outer shell, wherein the gas-filled layer is

disposed between the electrical conductor and the outer shell.

13. A system as in claim 12, wherein the outer shell is electrically nonconductive.

14. A system as in claim 12, wherein the outer shell is electrically conductive.

15. A system as in claim 14, further comprising a switch for electrically shorting the electrical conductor and the conductive outer shell.

16. A system as in claim 1, wherein the gas-filled layer comprises gas-containing balls.

17. A system as in claim 1, further comprising a flexible band that contains the gas-filled layer.

18. A system for generating heat, comprising:

an electrical conductor for generating an AEF in response to an AC voltage;

a gas-filled layer proximate to the electrical conductor, the gas-filled layer containing a plasma-forming gas for forming a plasma in response to an AEF;

an AC power source for applying an AC voltage to the electrical conductor.

19. A system as in claim 18, further comprising:

a conductive layer located proximate to the electrical conductor.

20. A system as in claim 19, wherein the gas-filled layer is located between the electrical conductor and the conductive layer.

21. A system as in claim 18, wherein the AC power source provides an AC voltage for generating an AEF having sufficient field strength to cause electric breakdown of gas in the gas-filled layer when a conductive layer is proximate to the electrical conductor.

22. A system as in claim 18, wherein the AC power source provides an AC voltage for generating an AEF having a strength in a range of about from 1 to 100 kV/cm.

23. A system as in claim 18, wherein the AC power source provides an AC voltage in a range of about from 10 kV to 1300 kV.

24. A system as in claim 18, wherein the AC power source provides an AC voltage having a frequency in a range of about from 50 Hz to 1 MHz.

25. A method for melting ice, comprising a step of:

generating an AEF in a gas-filled layer proximate to the ice for causing electric breakdown of gas and the formation of plasma in the gas-filled layer.

26. A method as in claim 25, wherein the step of generating an AEF includes generating an AEF having a strength in a range of about from 1 to 100 kV/cm.

27. A method as in claim 25, wherein the step of generating an AEF includes applying an AC voltage to an electrical conductor.

28. A method as in claim 27, wherein applying an AC voltage to the electrical conductor includes applying a voltage in a range of about from 10 kV to 1300 kV.

29. A method as in claim 27, wherein applying an AC voltage to the electrical conductor includes applying a voltage with a frequency in a range of about from 50 Hz to 1 MHz.

30. A method as in claim 27, wherein the electrical conductor is a main conductor of a power transmission line.

31. A method as in claim 27, further comprising disposing the gas-filled layer between the electrical conductor and a conductive layer.

32. A method as in claim 31, wherein the conductive layer includes ice.

33. A method as in claim 31, wherein the conductive layer includes a conductive metal-containing material.